

CLAIM AMENDMENTS

1-21. (PREVIOUSLY CANCELED)

22. (CURRENTLY AMENDED) An apparatus for manufacturing a light diffusing structure, comprising:

a transparent or translucent substrate;

a layer of photopolymerizable material; and

means for directing collimated or nearly-collimated light through the substrate and into the photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material; and

an array of tapered optical waveguides positioned between the substrate and the means for directing light, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

23. (ORIGINAL) An apparatus as set forth in claim 22, where the substrate is fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials.

24. (ORIGINAL) An apparatus as set forth in claim 22, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer.

25. (PREVIOUSLY AMENDED) An apparatus as set forth in claim 22, where the

photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer, a photoinitiator and a photoinhibitor.

26. (ORIGINAL) An apparatus as set forth in claim 22, where the layer of photopolymerizable material is on the substrate.

27. (ORIGINAL) An apparatus as set forth in claim 22, where the means for directing light generates light having a divergence angle of less than ten degrees.

28. (ORIGINAL) An apparatus as set forth in claim 22, where the means for directing light directs the light through the substrate in more than one dose.

29. (ORIGINAL) An apparatus as set forth in claim 22, further comprising means for removing the unphotopolymerized portion of the photopolymerizable material.

30. (ORIGINAL) An apparatus as set forth in claim 22, further comprising means for removing the photopolymerized portion of the photopolymerizable material from the substrate.

31. (ORIGINAL) An apparatus as set forth in claim 22, further comprising a transparent or translucent fill material on the surface of the photopolymerized photopolymerizable material.

32. (ORIGINAL) An apparatus as set forth in claim 31, where the fill material has an index of refraction less than that of the photopolymerizable material.

33. (ORIGINAL) An apparatus as set forth in claim 31, where the fill material contains light-scattering particles.

34. (CANCELED)

35. (PREVIOUSLY AMENDED) An apparatus as set forth in claim 22, where the photopolymerized photopolymerizable material is in juxtaposition to the input or the output surface of the tapered optical waveguides.

36. (PREVIOUSLY AMENDED) An apparatus as set forth in claim 22, where the tapered optical waveguides are lenticular.

37. (ORIGINAL) An apparatus as set forth in claim 22, further comprising:
means for removing the unphotopolymerized portion of the photopolymerizable material;
means for forming a metallic layer on the surface of the photopolymerized photopolymerizable material to form a conforming replica layer; and
means for applying the metallic replica layer to embossable material.

38. (ORIGINAL) An apparatus as set forth in claim 37, where the embossable material contains light-scattering particles.

39. (CANCELED)

40. (CANCELED)

41. (CANCELED)

42. (CURRENTLY AMENDED) An apparatus for manufacturing a light diffusing structure, comprising:
a transparent or translucent substrate fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, the substrate having

first and second surfaces generally flat and parallel to each other; a layer of photopolymerizable material, comprising at least one photopolymerizable monomer or oligomer, a photoinitiator and a photoinhibitor, deposited on the first surface of the substrate; a light source for directing collimated or nearly-collimated light through the second surface of the substrate and into the photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material; and means for removing the unphotopolymerized portion of the photopolymerizable material; and
an array of tapered optical waveguides positioned between the substrate and the light source, each tapered optical waveguide comprising:
an input surface that admits light;
an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and
a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

43-56. (CANCELED)

57. (CURRENTLY AMENDED) An apparatus for manufacturing a light diffusing structure, comprising a metallic layer formed on a layer of photopolymerizable material which photopolymerizable material is positioned on a transparent or translucent substrate and exposed to a source of collimated or nearly-collimated light first directed through a the transparent or translucent substrate for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material after the unphotopolymerized portion of the photopolymerizable portion has been removed; and
an array of tapered optical waveguides positioned between the substrate and the light source, each tapered optical waveguide comprising:
an input surface that admits light;
an output surface distal from the input surface, the output surface having a surface area less than

that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

58. (ORIGINAL) An apparatus as set forth in claim 57, where the substrate is fabricated from a material from one or more of the classes of

(a) amorphous materials;

(b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and

(c) purely crystalline materials.

59. (ORIGINAL) An apparatus as set forth in claim 57, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer.

60. (PREVIOUSLY AMENDED) An apparatus as set forth in claim 57, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer, a photoinitiator and a photoinhibitor.

61. (ORIGINAL) An apparatus as set forth in claim 57, where the photopolymerizable material is on the substrate.

62. (ORIGINAL) An apparatus as set forth in claim 57, where the light source generates light having a divergence angle of less than ten degrees.

63. (ORIGINAL) An apparatus as set forth in claim 57, where the light source generates light in more than one dose.

64. (PREVIOUSLY AMENDED) A mold for manufacturing a light diffusing structure,

comprising a metallic layer formed on a layer of photopolymerizable material which is positioned on a transparent or translucent substrate, said photopolymerizable material comprising at least one photopolymerizable monomer or oligomer, a photoinitiator and a photoinhibitor, which photopolymerizable material has been exposed to a source of collimated or nearly-collimated light first directed through the transparent or translucent substrate, the substrate being fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material after the unphotopolymerized portion of the photopolymerizable portion has been removed; and wherein said photopolymerized portion has a surface having smooth bumps ranging from about 1 micron to about 20 microns in both height and width.

65. (PREVIOUSLY PRESENTED) The apparatus of claim 22, wherein said photopolymerized portion has a surface having smooth bumps ranging from about 1 micron to about 20 microns in both height and width.

66. (PREVIOUSLY PRESENTED) The apparatus of claim 42, wherein said photopolymerized portion has a surface having smooth bumps ranging from about 1 micron to about 20 microns in both height and width.

67. (PREVIOUSLY PRESENTED) The apparatus of claim 57, wherein said photopolymerized portion has a surface having smooth bumps ranging from about 1 micron to about 20 microns in both height and width.

68. (CANCELED)